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What's In Rio's Pewter?

With jewelry-makers and their customers becoming increasingly interested in knowing exactly what materials are in the products they buy, Rio has been receiving lots of questions about our pewter. What is pewter made of? How is pewter defined? What are the standards of manufacture for pewter? Does it contain dangerous or toxic materials? Here is some information that deals with these and other questions you may have.* **Please Note:** Pewter items that contain even trace amounts of lead are not suitable for use in children's jewelry.

Defining Pewter

Unlike silver and gold, which are pure metals that are refined directly from ore deposits, pewter is an alloy (a mixture) of metals. While it is available in more than one alloy, pewter does have a clear definition established by the American Pewter Guild (APG), the American Society for Testing and Materials (now ASTM International) and, perhaps most importantly, the U.S. Federal Trade Commission (FTC). The APG and FTC definitions mirror one another due to the fact that the two organizations worked closely together during the late 1950s to formulate a shared definition. The APG used this definition to promote a quality product, and the FTC adopted the same definition to protect consumers from deception in the marketplace. In short, both the APG by-laws and the FTC define pewter, in its most basic type, as an alloy comprising no less than 90% tin.

The APG by-law reads:

Section 3.2 Pewter—The term “pewter” for the purpose of the By-Laws is a metal alloy product of which the chemical composition shall be not less than 90% Grade A Tin, with the remainder composed of metals appropriate for use in pewter.

The FTC definition restates this essential composition, but goes on to define unfair or deceptive use of the term “pewter” (<http://www.ftc.gov/bcp/guides/jewel-gd.shtm>). The specific Code of Federal Regulations (16 CFR 23.8) reads:

23.8—Misrepresentation as to the content of pewter.

- (a) It is unfair or deceptive to mark, describe, or otherwise represent all or part of an industry product as Pewter or any abbreviation if such mark or description misrepresents the product's true composition.
- (b) An industry product or part thereof may be described or marked as Pewter or any abbreviation if it consists of at least 900 parts per 1000 Grade A Tin, with the remainder comprised of metals appropriate for use in pewter.

The ASTM definition (<http://www.astm.org/Standards/B560.htm>) echoes the essential requirement for tin content and extends the definition as follows:

Designation: B 560-00

1.2 Pewter alloy shall be defined as having a composition within the range of 90 to 98% tin, 1 to 8% antimony, and 0.25% copper.

Moreover, the ASTM standard limits the maximum amount of lead to 0.05% lead (500ppm). It is important to note that only the ASTM definition of pewter actually limits the amount of lead allowed in pewter, as long as the tin content is at least 90%.

Looking closely at the APG and FTC definition, the single most important point made in those two definitions is that **any** metal advertised or sold as pewter **must** contain at least 90% tin. Metals that contain less tin do not qualify as pewter under the Federal Trade Commission regulation; advertising as them as pewter is unfair and/or deceptive.

*The information in this document is provided courtesy of Steve Tierra, a professional in manufacture of pewter findings for more than 30 years.

Lead In Pewter

Another important point that should be noted in the APG and FTC standards is that pewter is not, by definition, required to be lead-free. Metallurgists would confirm that lead falls in the category of “metals appropriate for use in pewter,” as it has historically been added in various alloys over the centuries. The ASTM Standard for pewter limits the lead content to .05% (500ppm) but this standard does not have the force of law, and the presence of lead would not disqualify a 90% tin alloy from being sold as pewter under the APG and FTC standards. Simply put: pewter, by definition or practice, is not necessarily lead-free.

In fact, there is a major distinction between pewter alloys that intentionally contain lead and are not promoted otherwise, and those that are advertised as “lead-free.” Many reputable suppliers offer pewter alloys with lead concentrations between 0.5% and 10% total lead by weight for casting heavy section parts such as belt buckles or promotional items such as key chain tags. Unfortunately, the definition of the term “lead-free,” when applied to pewter, rests on much less solid ground than the definition of pewter itself.

In the early 1990s, the term “lead-free pewter” was commonly used in the trade and was specifically applied by metal suppliers to alloys of 90% (900,000ppm) tin made with no more than .05% (500ppm) lead. The voluntary adoption of this “standard” appears to have been to identify alloys that would meet the Food and Drug Administration (FDA) regulation that limited lead in pewter that would come in contact with food (<http://www.fda.gov/downloads/Food/FoodSafety/RetailFoodProtection/FoodCode/FoodCode2009/UCM188545.pdf>). That regulation, FDA 2009 Food Code 4-101.13 (B), states that “Pewter alloys containing lead in excess of 0.05% may not be used as a Food-Contact Surface.” Interestingly, until January 1, 2010, cast brass plumbing fixtures and pipe—even those carrying drinking water—could legally be sold as “lead-free” if they contained as much as 8% lead (80,000ppm), according to the California Department of Toxic Substances Control (<http://www.dtsc.ca.gov/PollutionPrevention/upload/lead-in-plumbing-fact-sheet.pdf>). While new federal legislation (enacted as Senate Bill 3874) redefines “lead-free” in pipe for drinking water as containing no more than .25% (2,500ppm), that concentration is still 5 times the amount of lead considered allowable in lead-free pewter. To this day, there is no published industry or governmental definition of “lead-free” pewter, and the term is used all too loosely, often to the extent of declaring a pewter item to be “100% lead-free.”

What /s Lead-Free?

Even with the actions taken first by the State of California and more recently by the Consumer Products Safety Commission, the definition of “lead-free” still has not received clarification. In 1995, a pewter item testing at 450ppm would have been considered by the trade as “lead-free.” In 2011, that same item would not necessarily be considered “lead-free” due to the steadily dropping threshold for allowable lead concentrations in “children’s jewelry” under the Consumer Product Safety Improvement Act (CPSIA). While this act is specifically directed toward a narrow definition for children’s jewelry, the effect has been to create an increased awareness of lead in metal alloys regardless of whether or not the product is intended for children.

Without a clear definition of “lead-free,” metal suppliers and the trade in general have been left to monitor themselves. By and large, most suppliers, manufacturers, wholesalers and retailers abide by the understanding that, even when a particular product is not subject to the CPSIA lead limit (currently 100ppm), they will not promote that product as “lead-free” unless it contains less than the old FDA limit of 500ppm.

Regarding products are promoted as “100% lead-free”: While it is, in theory, possible to cast a pewter product that would test at 0% (0ppm) lead, the practical reality is that production quantities of high-quality “lead-free” pewter contain somewhere between 0.003% and 0.01% (30–100ppm) lead in the alloy. This lead is not intentionally added, but rather occurs naturally in the ores that are refined to produce one or more of the elemental metals used to make the pewter alloy itself. Metal refiners continually strive to keep this “trace” out of the mixture, but the realities of the refining and alloy process make it extremely difficult to consistently eliminate all of the trace lead. Hence, claims of “100% lead-free” pewter should be viewed with skepticism.

To summarize: Pewter, in general, should not be presented as “100%” lead-free and, in order for any pewter to be presented as “lead-free,” it must not only contain 90% tin to qualify as pewter in the first place, but must also meet the industry-accepted standard of no more than 0.05% (500ppm) total lead by weight.